

CLAIMS

What is claimed is:

1. An isolated nucleic acid fragment encoding all or a substantial portion of an acid triacylglycerol lipase comprising a member selected from the group consisting of:

(a) an isolated nucleic acid fragment encoding all or a substantial portion of the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, SEQ ID NO:12, SEQ ID NO:14, SEQ ID NO:16, SEQ ID NO:18 and SEQ ID NO:20;

(b) an isolated nucleic acid fragment that is substantially similar to an isolated nucleic acid fragment encoding all or a substantial portion of the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, SEQ ID NO:12, SEQ ID NO:14, SEQ ID NO:16, SEQ ID NO:18 and SEQ ID NO:20; and

(c) an isolated nucleic acid fragment that is complementary to (a) or (b).

2. An isolated polynucleotide comprising:

(a) a nucleotide sequence encoding a polypeptide having triacylglycerol lipase activity, wherein the polypeptide has an amino acid sequence of at least 80% sequence identity, based on the Clustal V method of alignment, when compared to one of SEQ ID NO:24, or

(b) a full complement of the nucleotide sequence.

3. The polynucleotide of Claim 2, wherein the amino acid sequence of the polypeptide has at least 85% sequence identity, based on the Clustal V method of alignment, when compared to SEQ ID NO:24.

4. The polynucleotide of Claim 2, wherein the amino acid sequence of the polypeptide has at least 90% sequence identity, based on the Clustal V method of alignment, when compared to SEQ ID NO:24.

5. The polynucleotide of Claim 2, wherein the amino acid sequence of the polypeptide has at least 95% sequence identity, based on the Clustal V method of alignment, when compared to SEQ ID NO:24.

6. The polynucleotide of Claim 2, wherein the amino acid sequence of the polypeptide comprises SEQ ID NO:24.

7. The polynucleotide of Claim 2 wherein the nucleotide sequence comprises SEQ ID NO:23.

8. A vector comprising the polynucleotide of Claim 2.

9. A recombinant DNA construct comprising the polynucleotide of Claim 2 operably linked to at least one regulatory sequence.

10. A method for transforming a cell, comprising transforming a cell with the polynucleotide of Claim 2.

11. A cell comprising the recombinant DNA construct of Claim 9.

12. A method for producing a plant comprising transforming a plant cell with the polynucleotide of Claim 2 and regenerating a plant from the transformed plant cell.

13. A plant comprising the recombinant DNA construct of Claim 9.

14. A seed comprising the recombinant DNA construct of Claim 9.

15. A method for isolating a polypeptide having triacylglycerol lipase activity comprising isolating the polypeptide from a cell or culture medium of the cell, wherein the cell comprises a recombinant DNA construct comprising the polynucleotide of Claim 2 operably linked to at least one regulatory sequence.

16. A method of altering the level of triacylglycerol and cholesteryl esters in a host cell comprising: (a) transforming a host cell with the recombinant DNA construct of Claim 9; and (b) growing the transformed host cell under conditions that are suitable for expression of the recombinant DNA construct wherein expression of the recombinant DNA construct results in production of altered levels of the triacylglycerol and cholesteryl esters in the transformed host cell when compared to a non-transformed cell.

17. A method of obtaining novel plant seed oils comprising:
a) transforming a plant cell with the recombinant DNA construct of Claim 9;
b) regenerating a transgenic plant from said plant cell;
c) allowing the transgenic plant to set seed;
d) harvesting seed from said transgenic plant;
d) isolating seed oil from said seed; and
d) comparing the seed oil isolated from the seed from said transgenic plant with seed oil isolated from a non-transgenic plant
wherein said seed oil isolated from the seed from said transgenic plant is novel when compared to said seed oil isolated from a non-transgenic plant.